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Architectural Thinking for Secure Design

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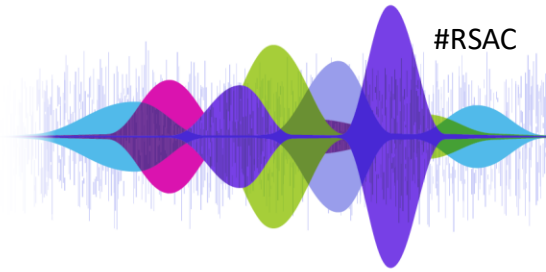

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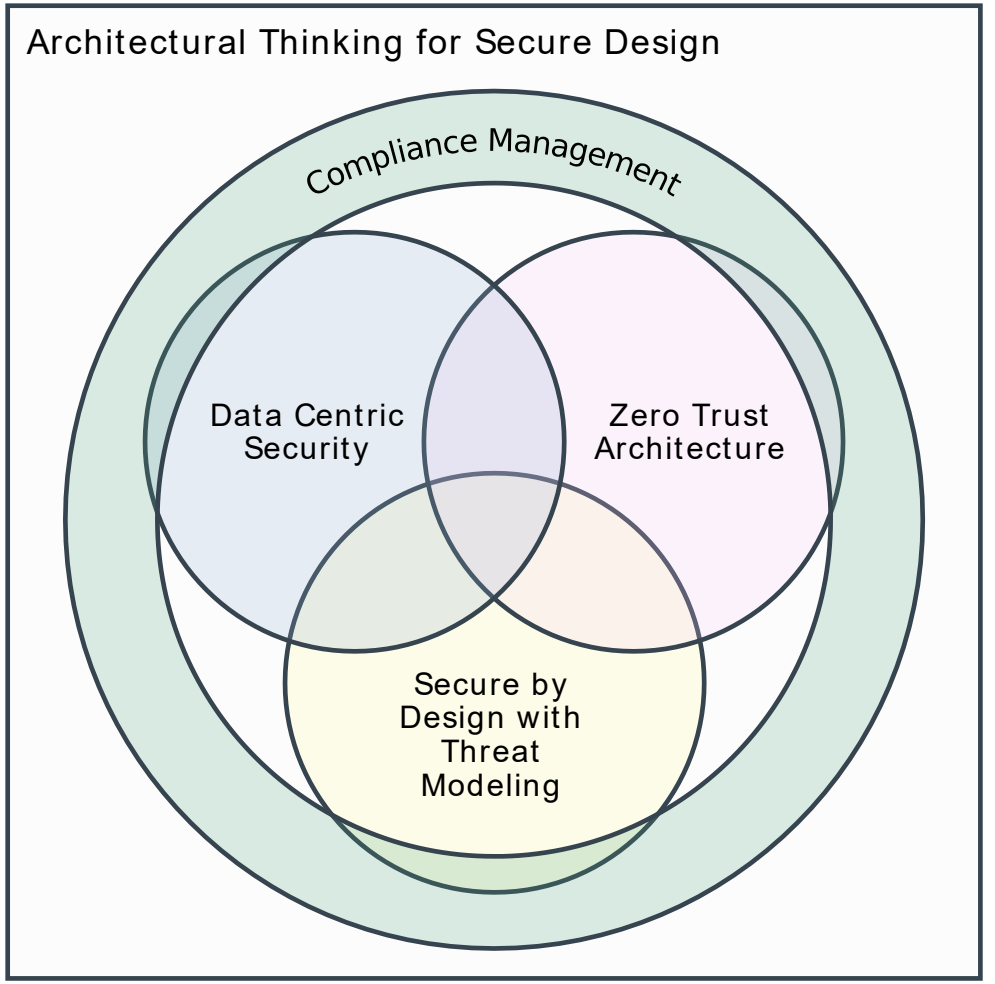
Architectural Thinking for Secure Design is an integration of different techniques



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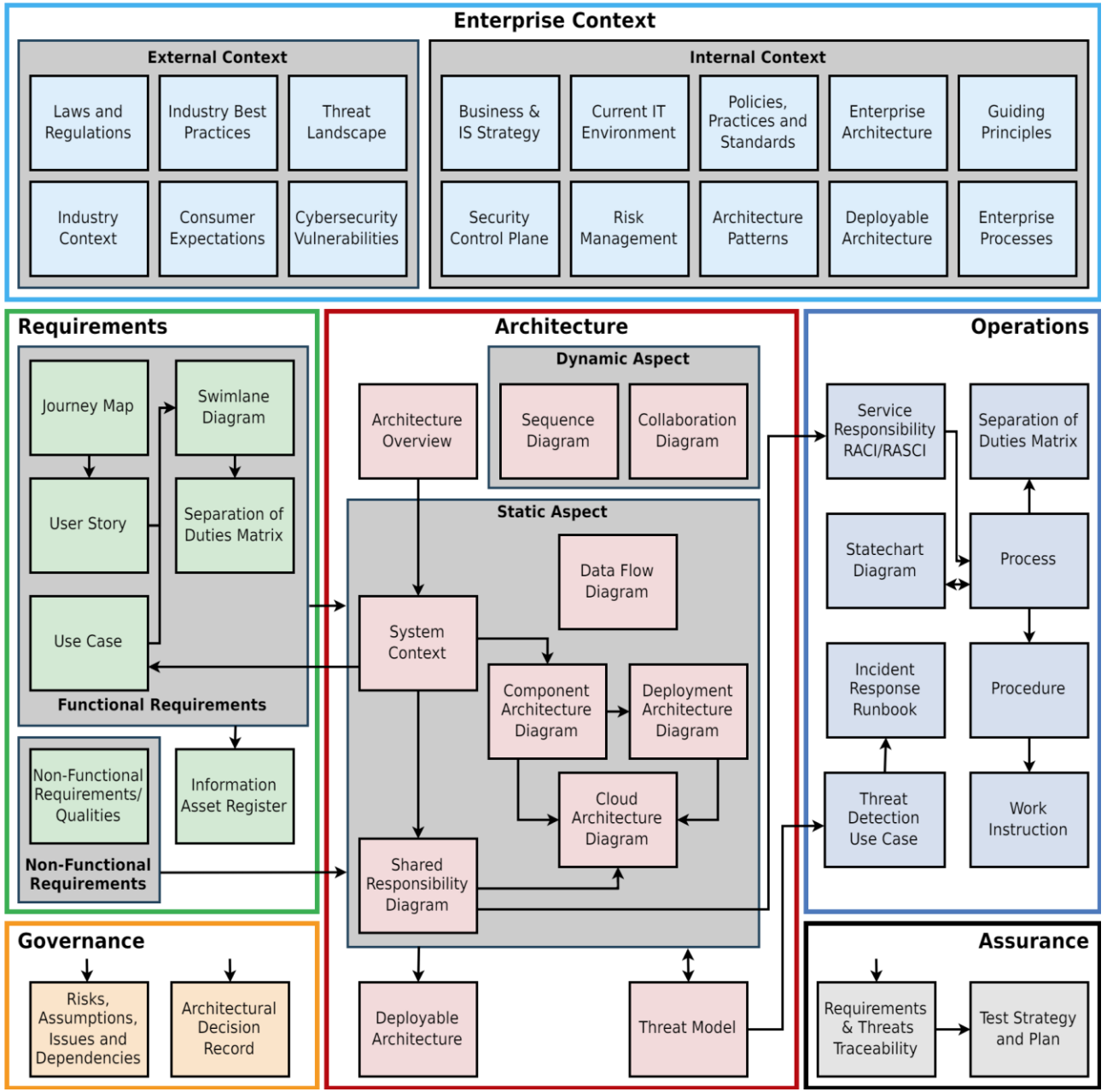
Stage 1 – Background and Layer 1

Artefact Dependency

We've developed an integrated set of artefacts and techniques



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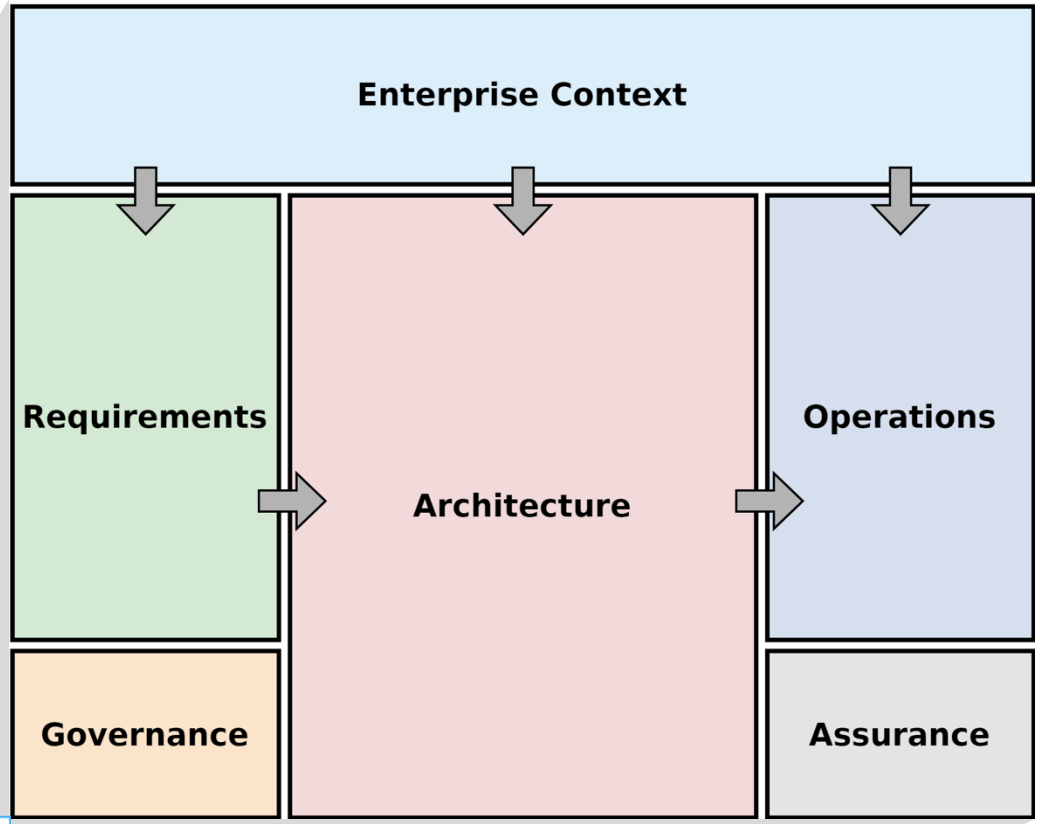
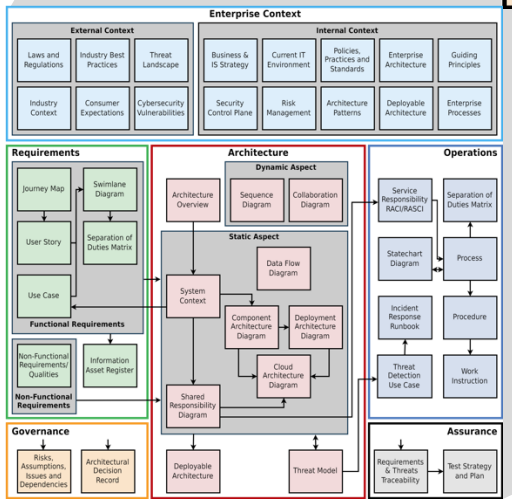
Artefact Dependency

It’s grouped into stages of architectural thinking





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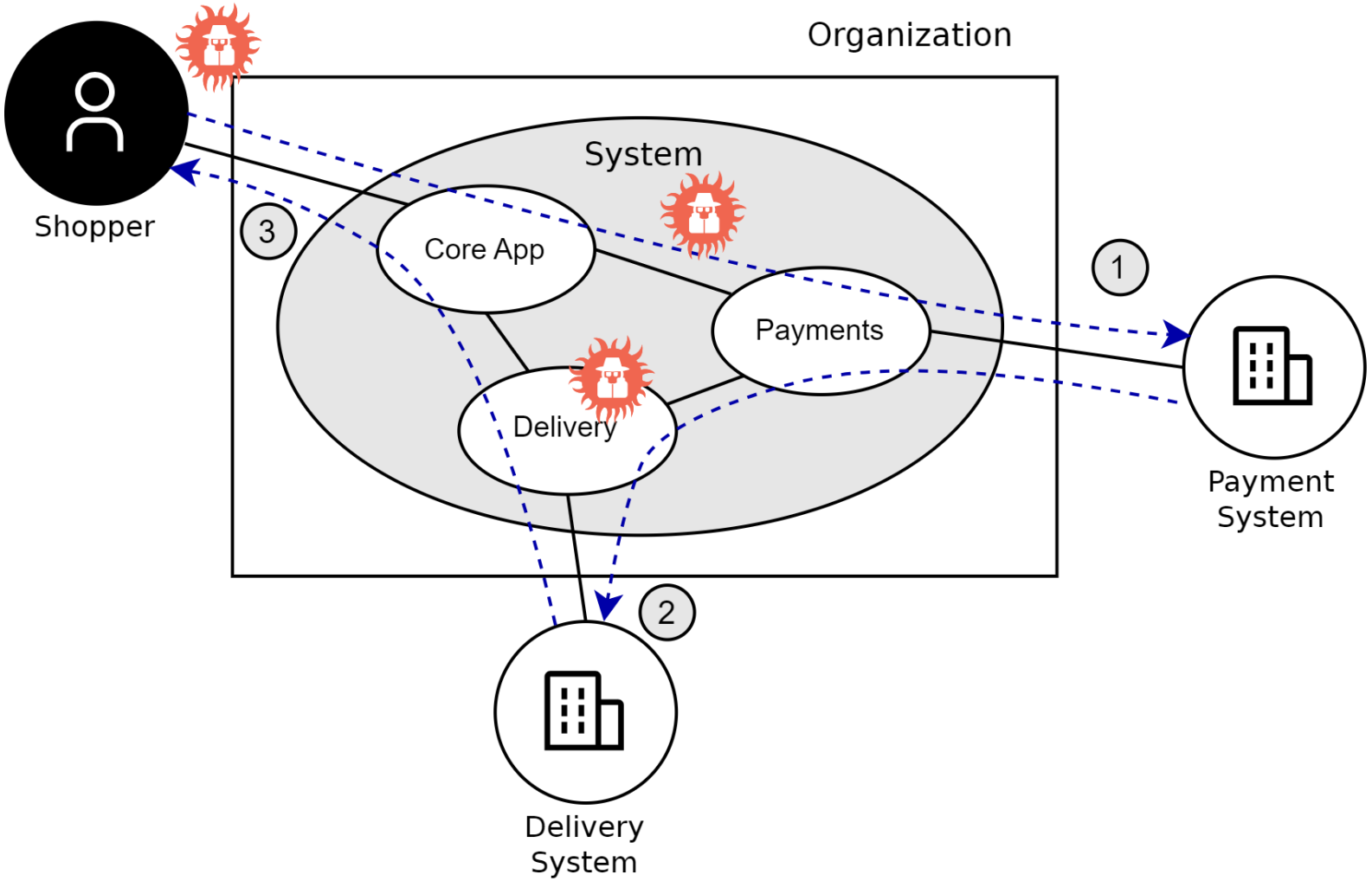
It's all about the threat to data, in transit, at rest and in processing



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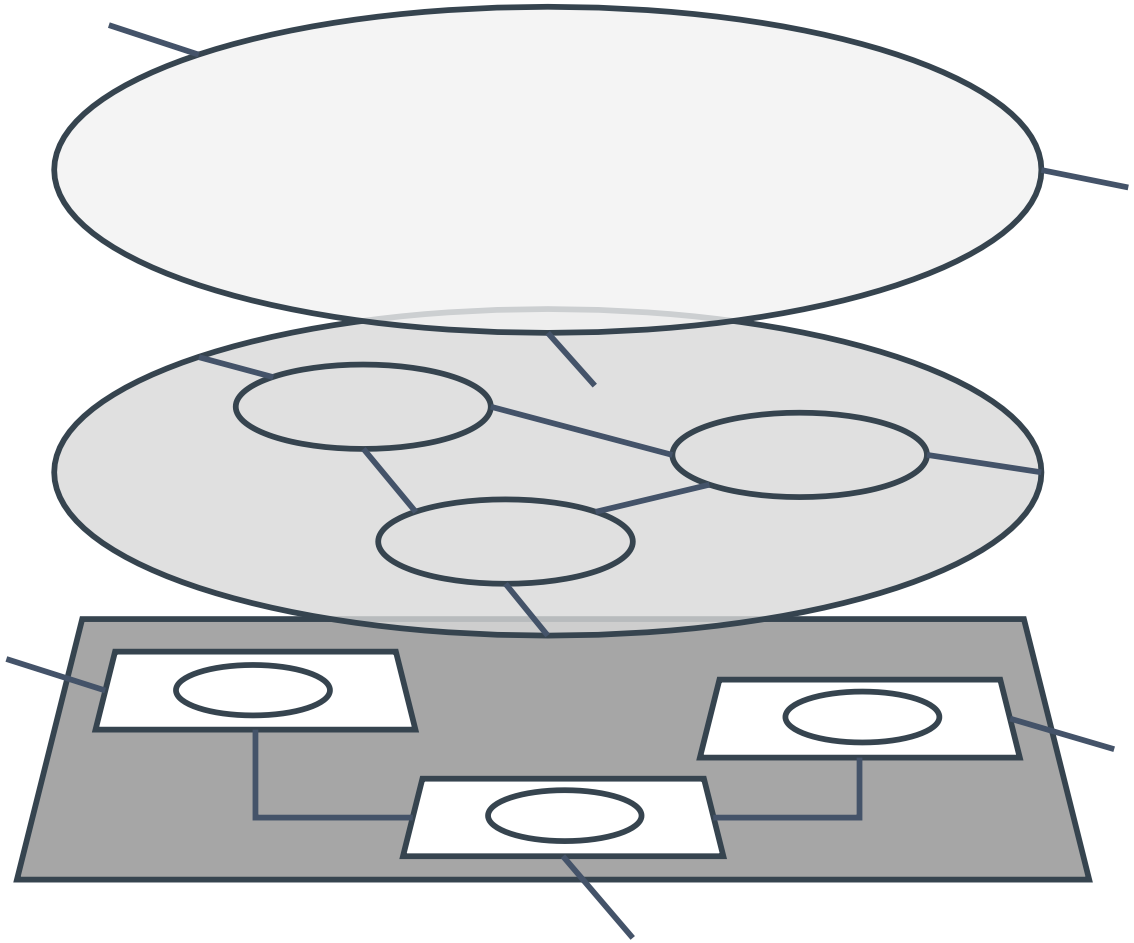
The security architecture is developed in layers



System Context

Component Architecture

Deployment Architecture

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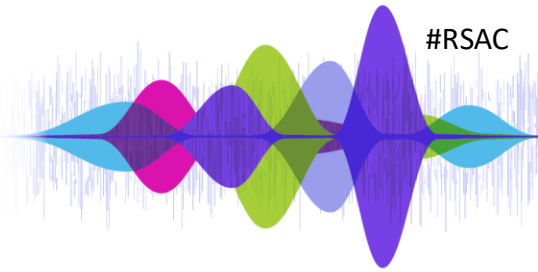

Teams will complete three brief exercises

- Each table will complete three very brief exercises
- Each exercise will touch a layer of architectural thinking
- The exercises will use a case study
- More information on the case study we use can be found at https://securityarchitecture.cloud/rsac/25/case-study

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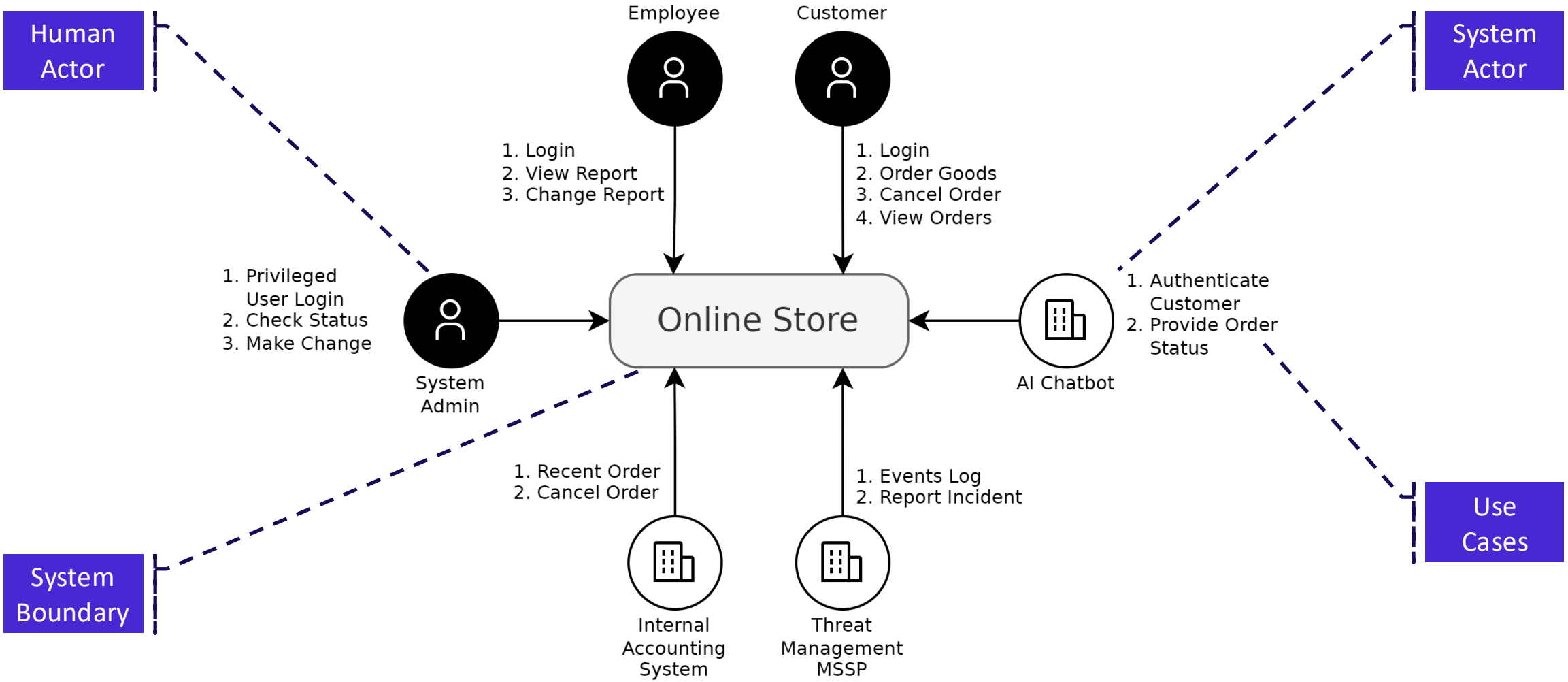
Understand the boundary of the system and the actors triggering transaction flows to process data



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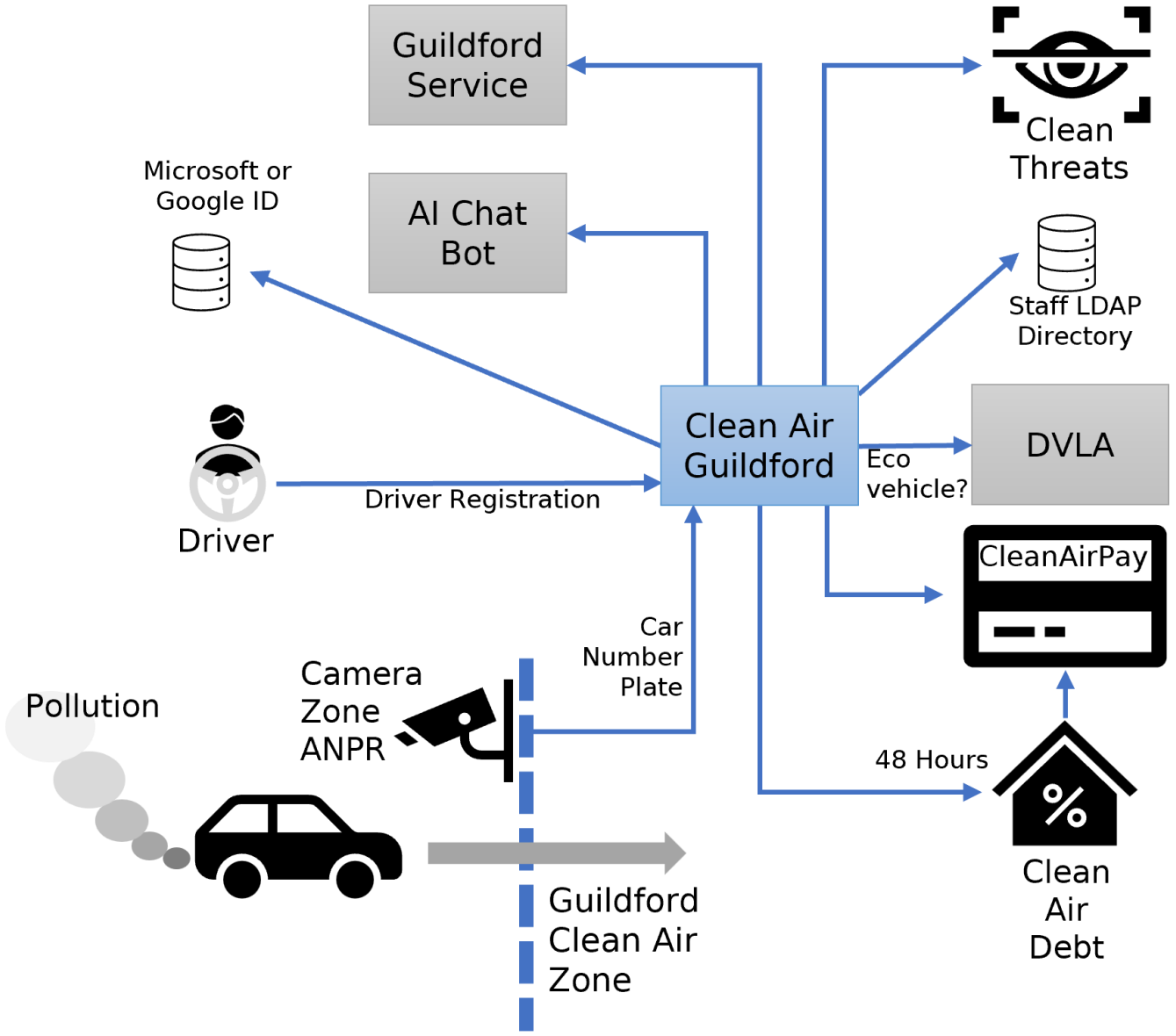
Clean Air Guildford Case Study

- Architecting an application to charge polluting vehicles to enter a city



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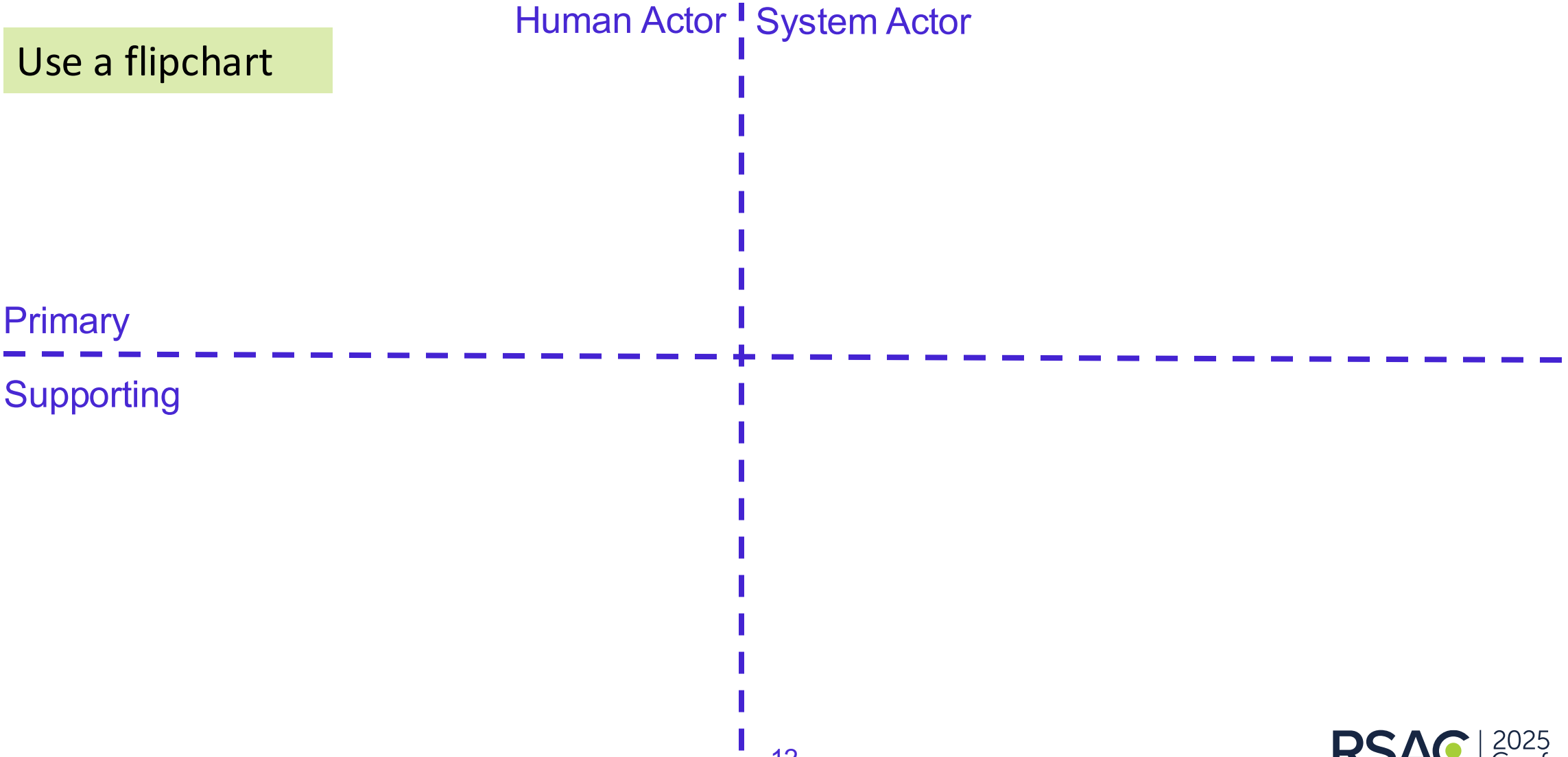
Team Exercise:
Identify the external actors for this application

Use a flipchart



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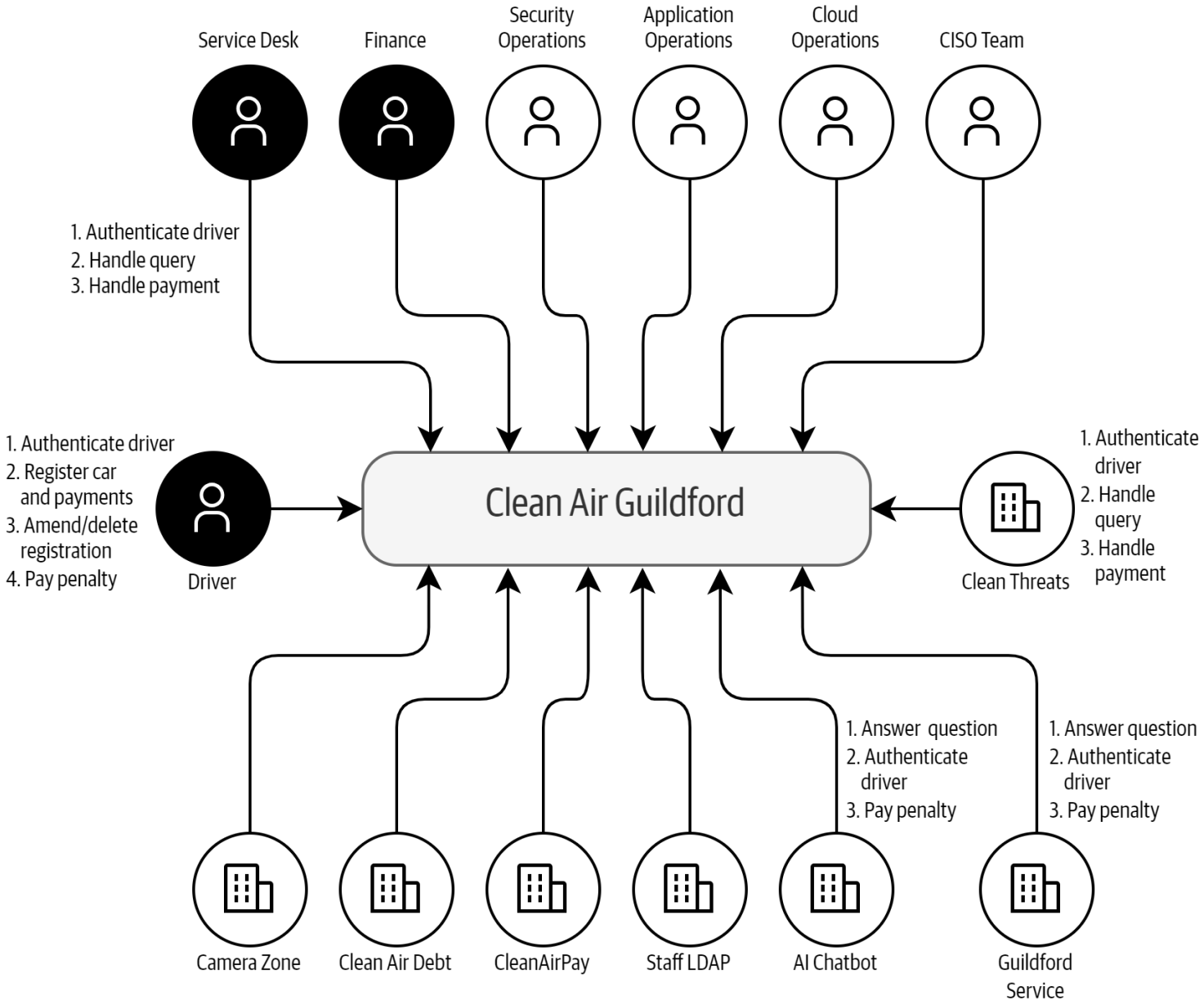
Stage 2 – Review and Layer 2

Clean Air Guildford System Context



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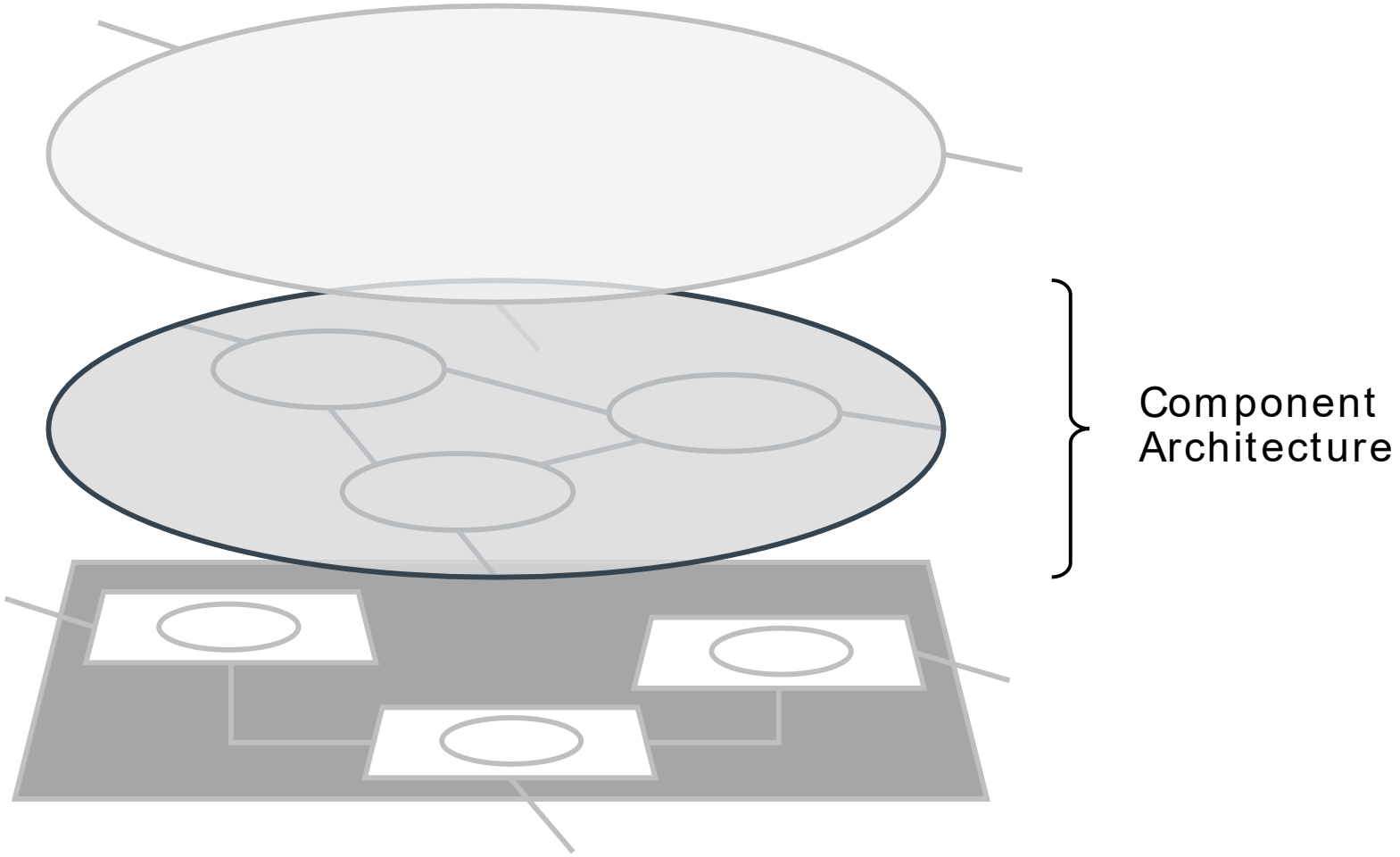
Next, we are going to examine the functional components inside the system boundary



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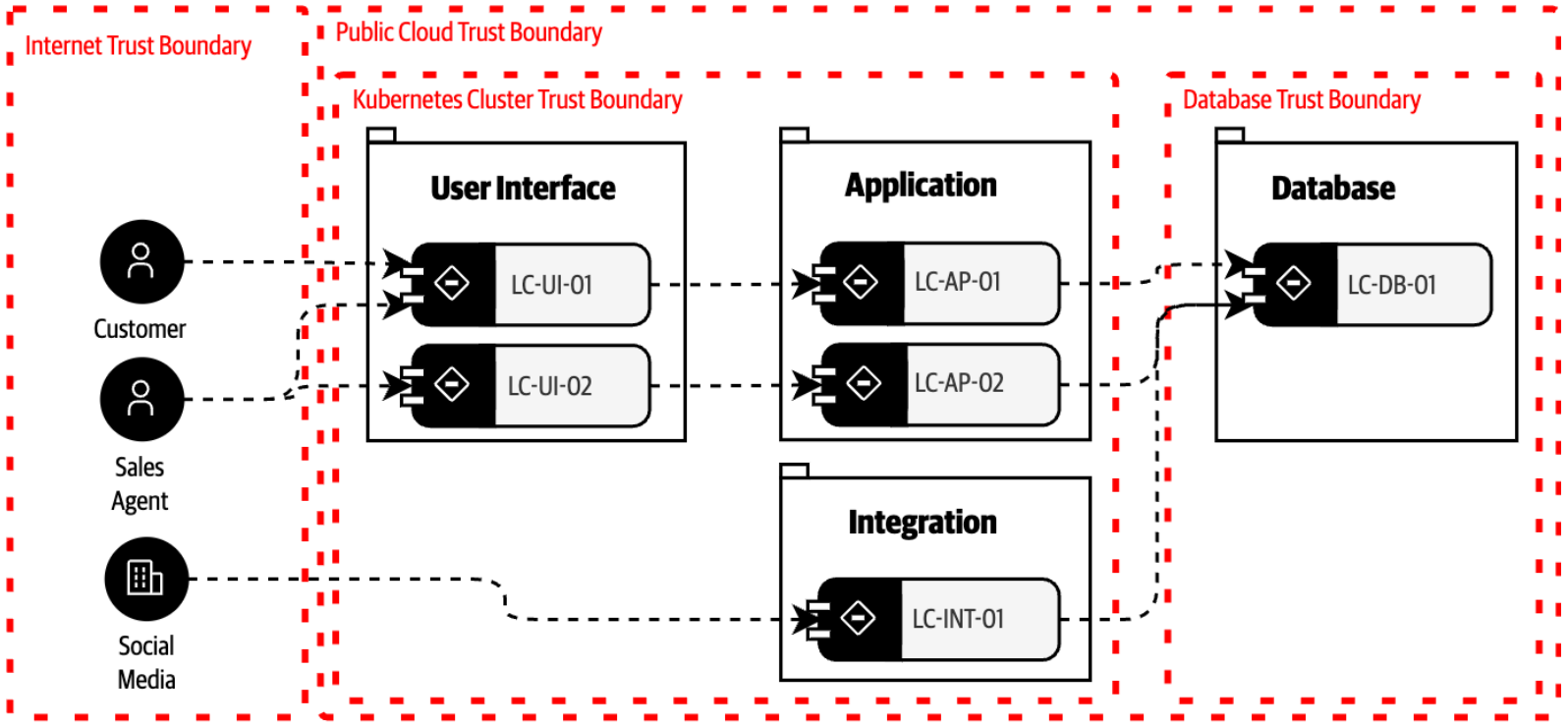
A component architecture diagram shows the functional components, subsystems and trust boundaries



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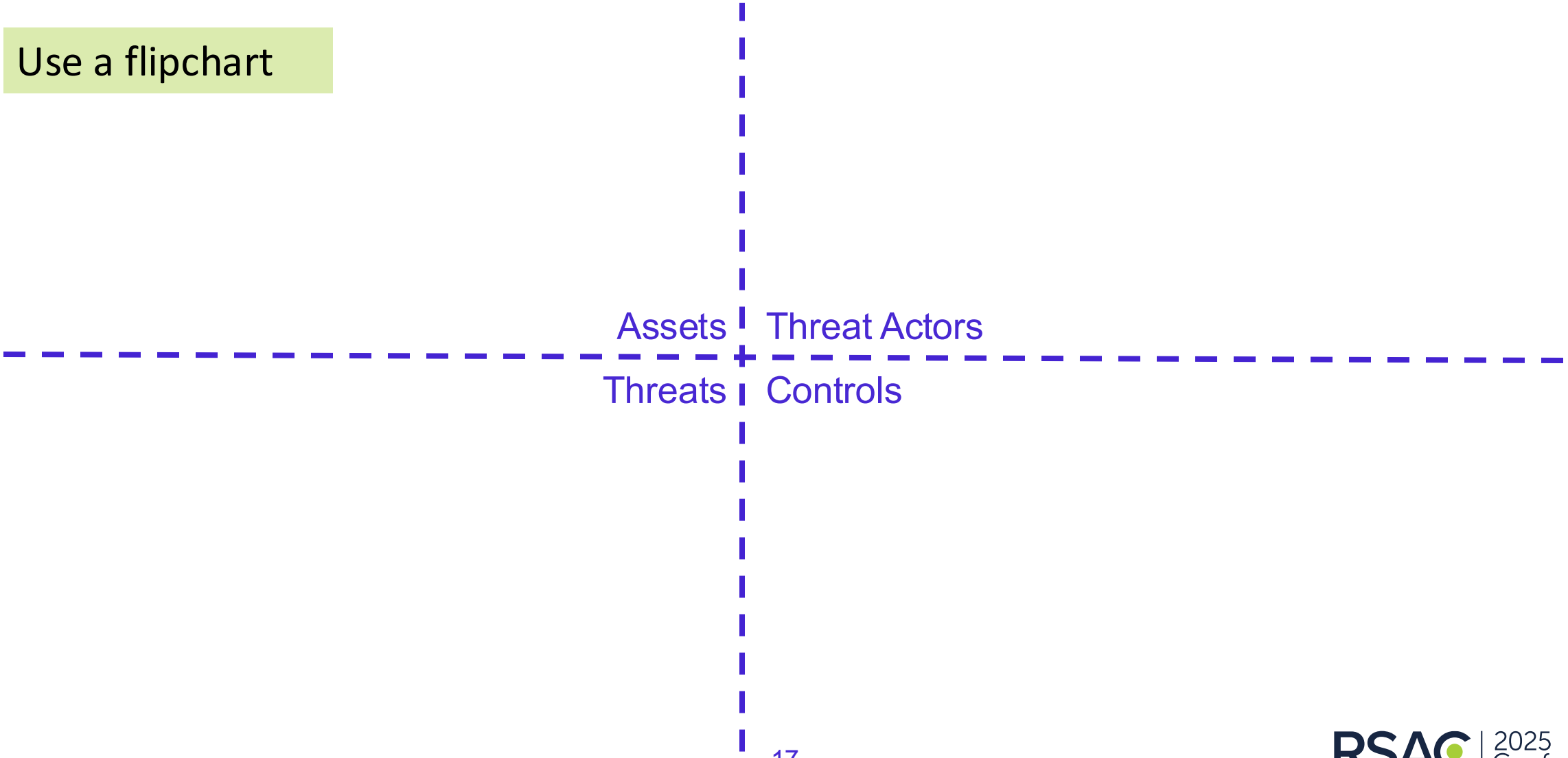
Team Exercise:
Identify Assets, Threat Actors, Threats and Controls

Use a flipchart



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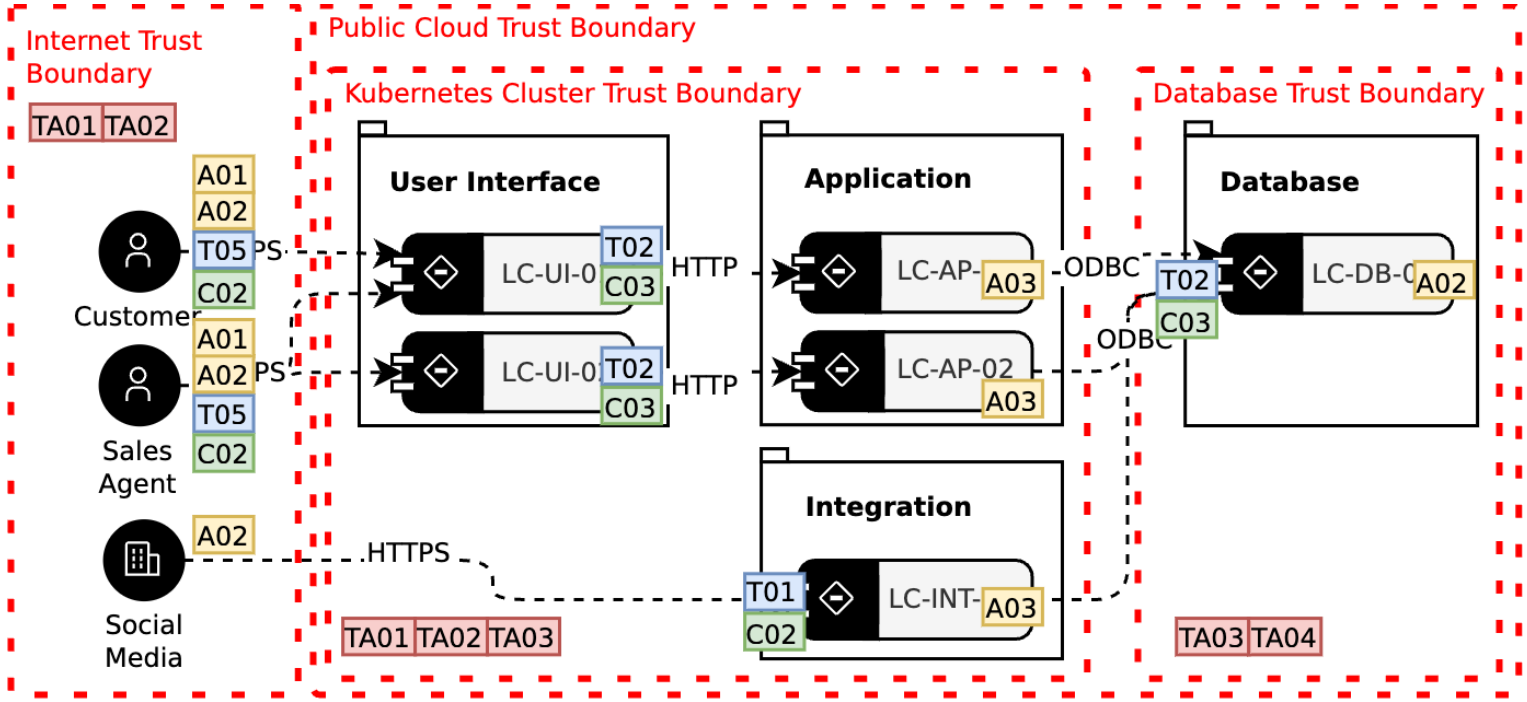
Stage 3 – Review and Layer 3

Complete the first stage of threat modelling, then move to the deployment of the functional components



Assets	Threats
A01 - User Session ID A02 - Customer Information A03 - DB Access Credentials	T01 - Lack of IAM Controls T02 - missing sec. transp. layer T05 - Exploit of website vulns
Threat Actors	**Controls**
TA01 - External authorised TA02 - External unauthorised TA03 - Internal authorised TA04 - Internal unauthorised	C01 - Multi Factor Authentication C02 - Web Application Firewall C03 - Encryption

Component List
LC-UI-01 - Customer registration
LC-UI-02 - CRM UI
LC-AP-01 - Customer mgmt
LC-AP-02 - CRM Appl.
LC-DB-01 - CRM Database
LC-INT-01 - Social Media Integration

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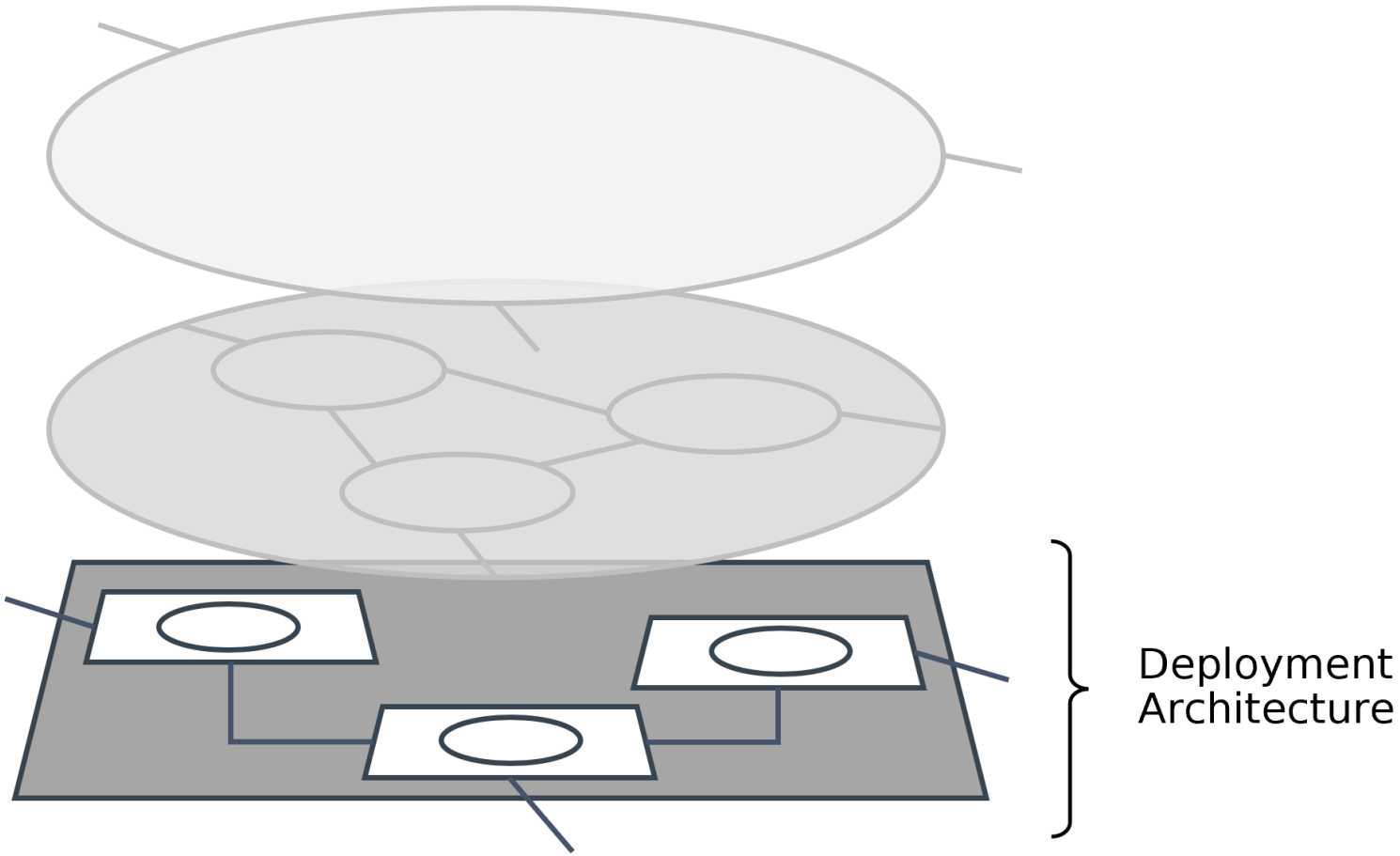
Next, we are going to examine the deployment of the functional components onto the infrastructure



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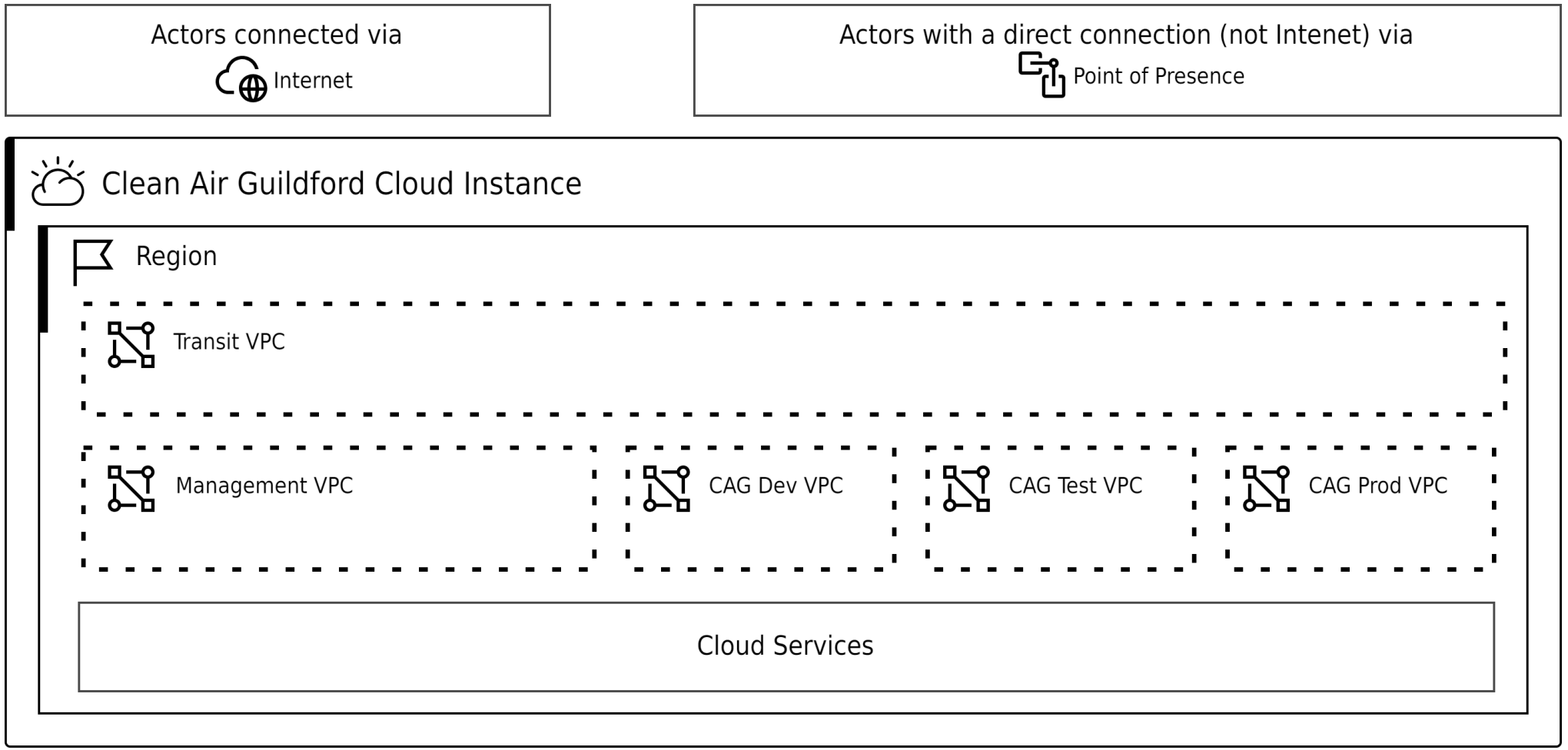
We start with a simple view of the deployment architecture for your workload



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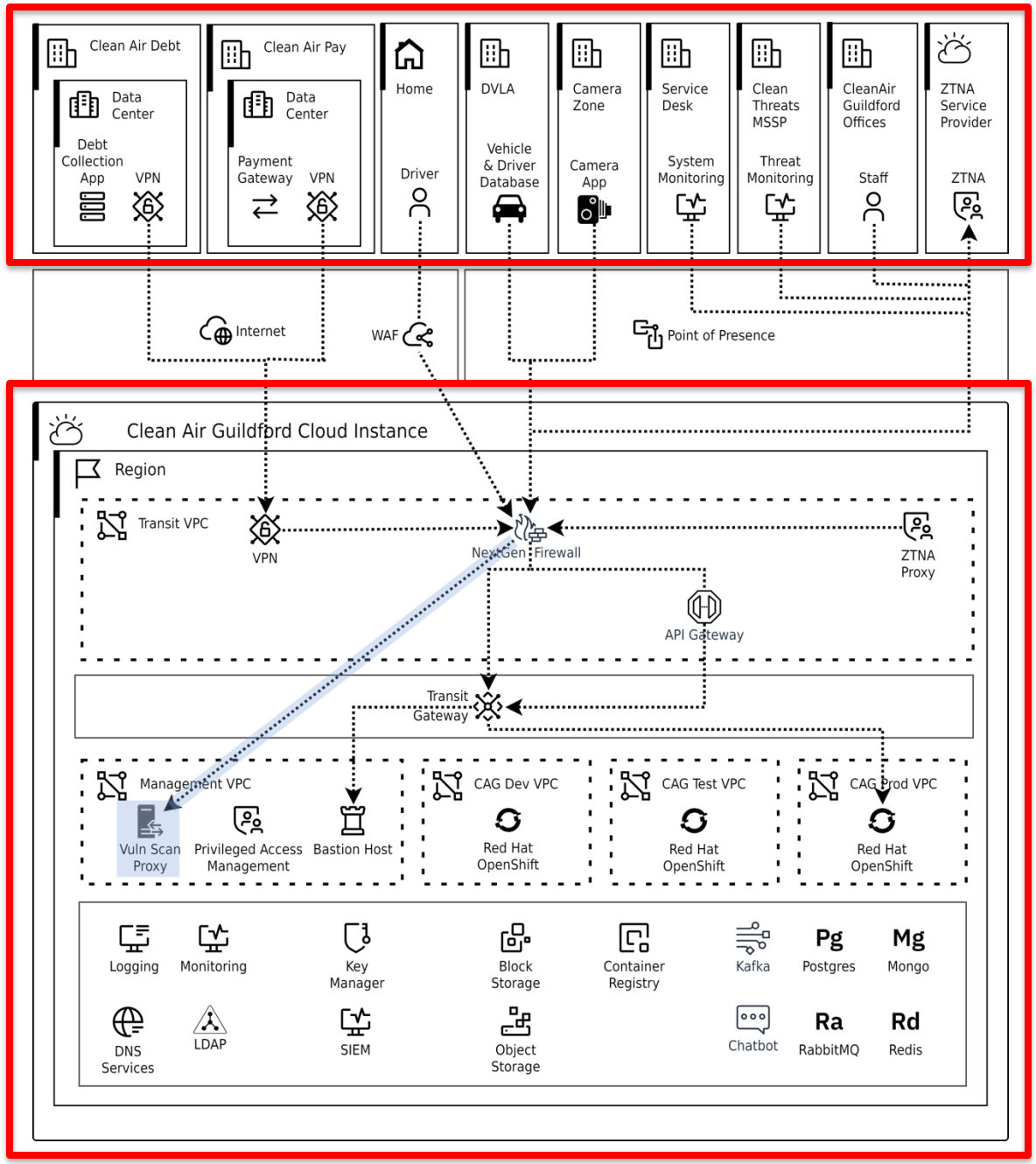
Complete the deployment architecture



Actors

System Context

System

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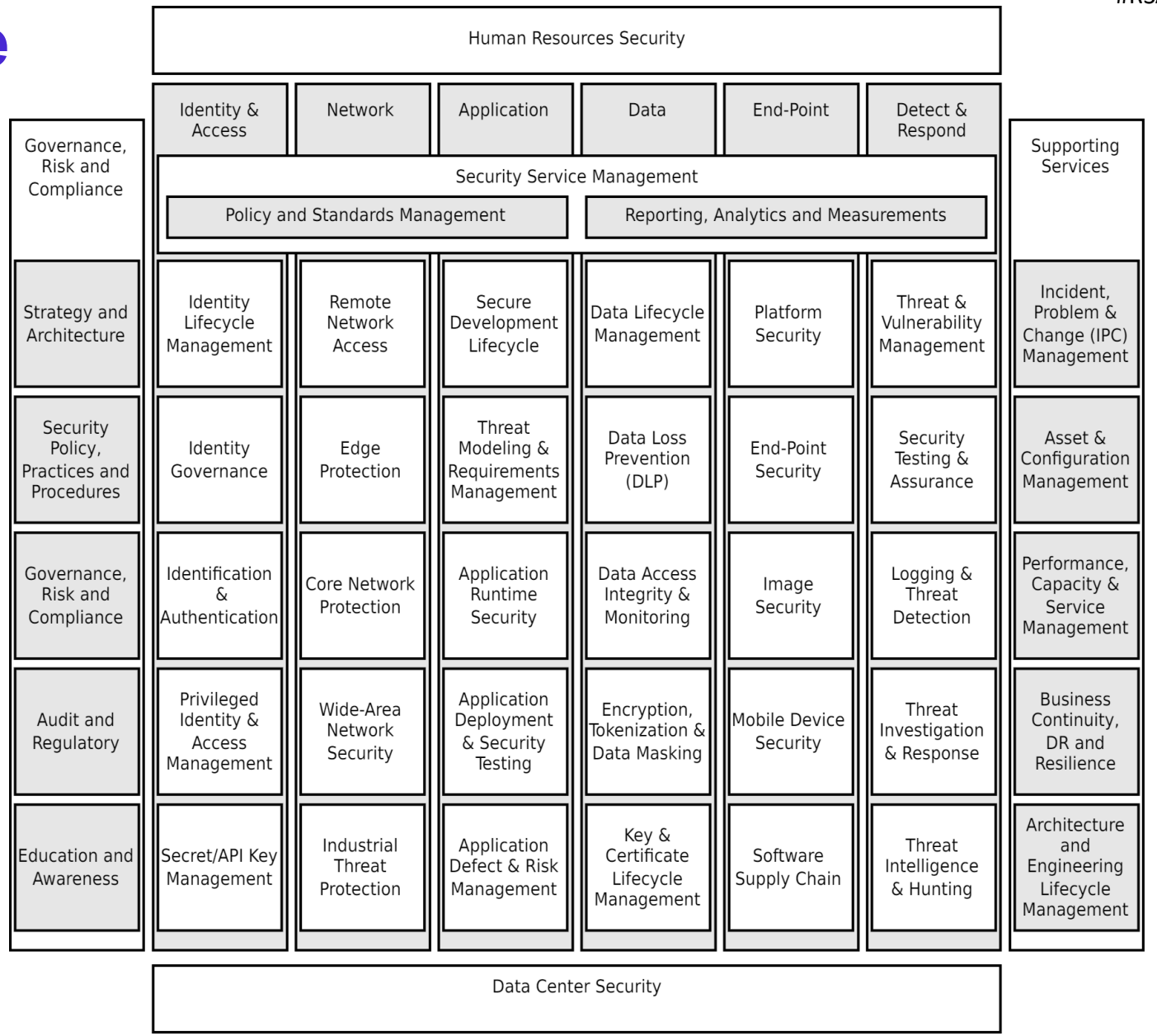
Guided by an Enterprise Security Architecture

Identify additional services needing integrating on the deployment architecture

Identity & Access	
Network	
Application	
Data	
End-Point	
Detect & Respond	



Use a flipchart

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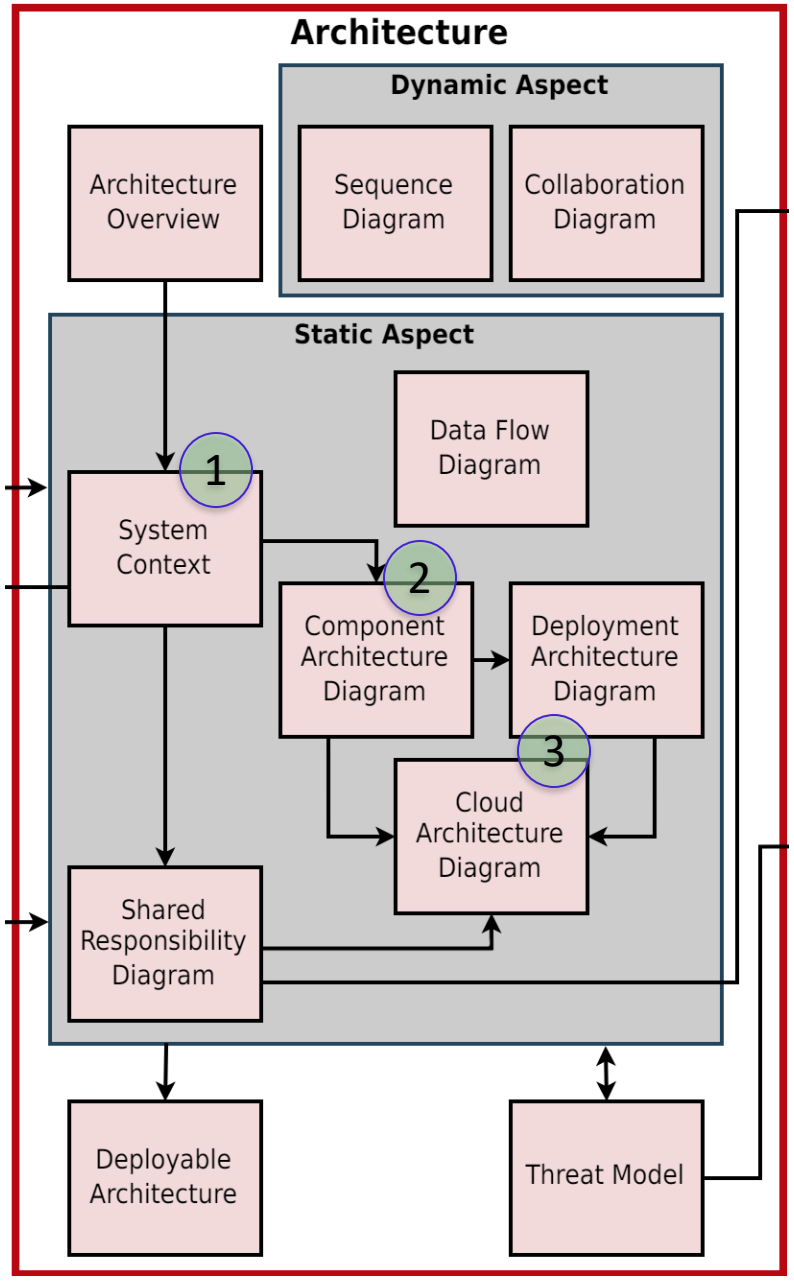
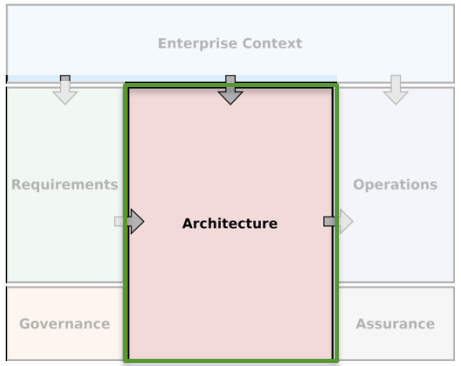
Stage 4 – Wrap Up

Building an architecture top down





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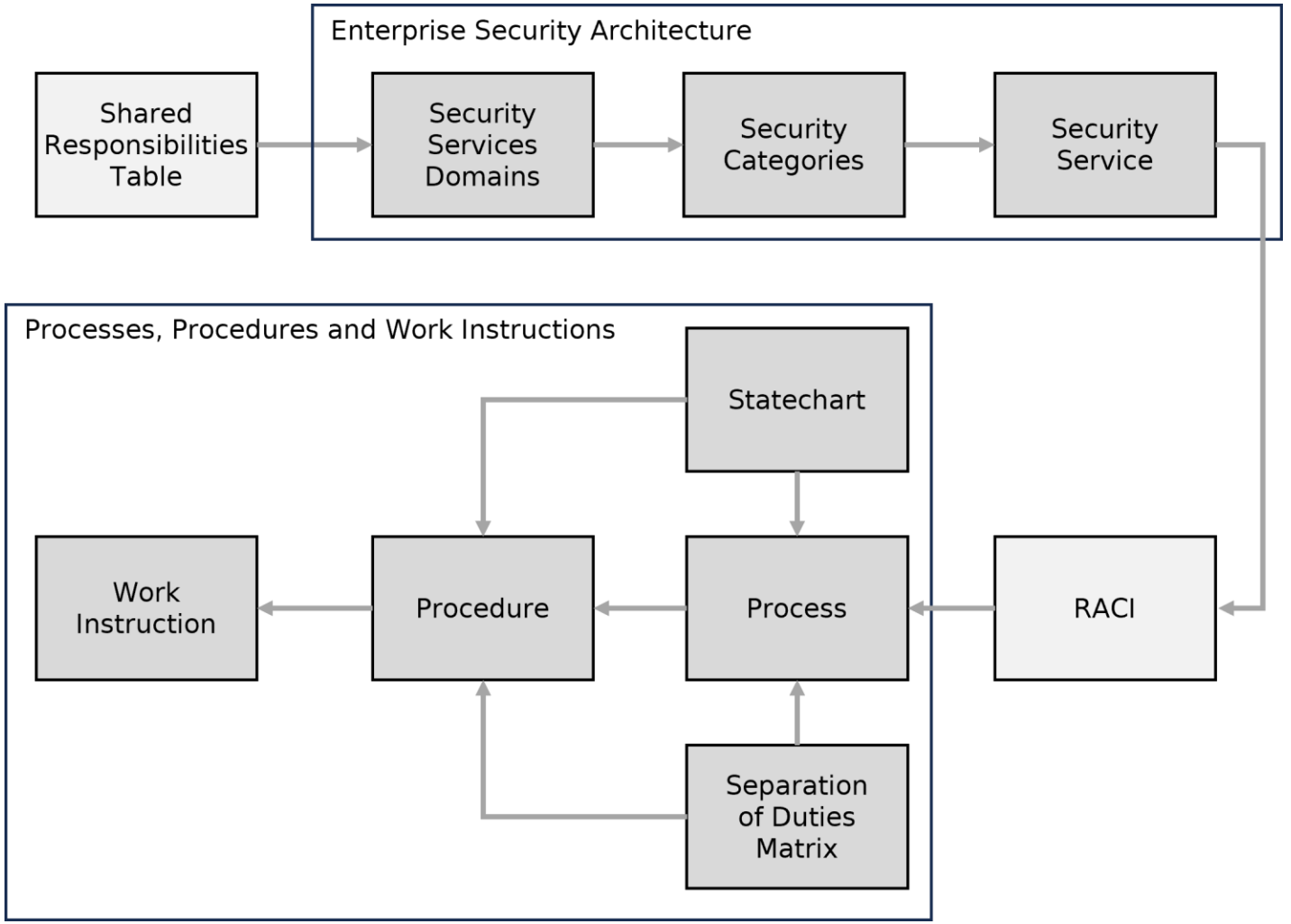
Take the identified security services and define RACIs, processes, procedures and work instructions



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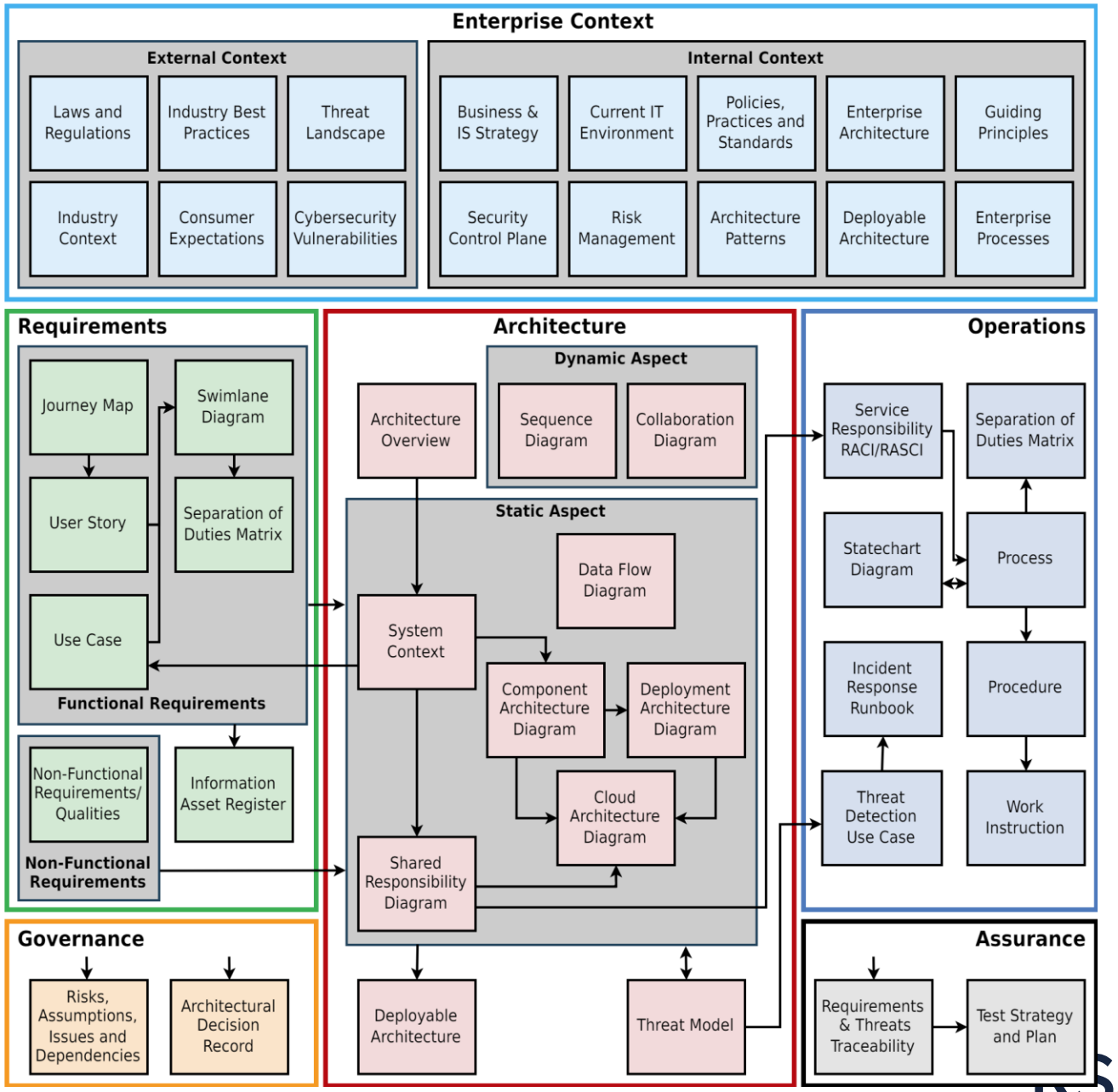
Artefact Dependency

There are additional artefacts that are part of the architectural thinking process



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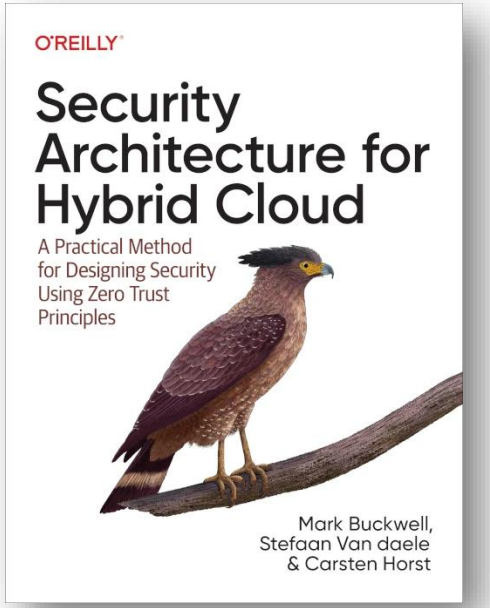
Apply What You Have Learned Today

- **Learn - this week**
  - Look at answers and further information https://securityarchitecture.cloud/rsac/25/answers
  - Listen to RSA Conference past contributions on security architecture
- **Review - in the next month or two**
  - Review chapters 5, 6, 8 and 9 in Security Architecture for Hybrid Cloud
  - Is your architectural thinking process more art than engineering?
    - Use the artifact dependency as a heatmap of activities performed today
    - Does ownership of artifacts extend to application and infrastructure architects?
    - Is there an architectural thinking for security champion?
- **Action - over the next year**
  - Integrate security artifacts into existing architectural thinking method
  - Perform method training with case study (not just click-and-test education)
  - Measure and improve architectural thinking for security practices
    - Use review techniques to assess extent of deployment


O'REILLY
Security Architecture for Hybrid Cloud
A Practical Method for Designing Security Using Zero Trust Principles
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